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BOOK REVIEWS

Review of Trends in Theory and Practice of Nonlinear Differential Equations, Lecture Notes in Pure and Applied Mathematics, Vol. 90, Marcel Dekker, Inc., New York and Basel, 1984, V. Lakshmikantham, Ed.

This volume contains the proceedings of an international conference held at the University of Texas at Arlington on June 14–18, 1982. The theme of the conference was recent trends in theory and applications of nonlinear differential equations. There are 73 articles in the volume devoted to various topics in this subject. Among the topics presented are spectral theory for symmetric pairs of differential operators, Lotka–Volterra systems, generalized inverses for linear manifolds, nonlinear problems at resonance, steepest descent methods, reaction-diffusion equations, Lyapunov stability, stochastic differential equations, comparison and frequency domain techniques, delay differential equations, method of upper and lower solutions, Newton-like methods, periodic solutions of nonlinear problems, population biology, effects of harvesting on population systems, models of toxicant populations, nonlinear equations of heat flow, inclusion principle for hereditary systems, vector Lyapunov functions in the analysis of dynamical properties of differential equations, recent topics on nonlinear contraction semi-groups, set valued extensions of integral inequalities, global controllability of nonlinear delay systems, cone-valued Lyapunov functions, large-scale systems, quasi-solutions, almost periodicity of solutions of parabolic equations, generalized Hopf bifurcation and exchange of stability and nonlinear elliptic problems. The volume is dedicated to Professor E. A. Coddington, who was honored by the conference participants. The volume constitutes a valuable contribution to recent developments in a great variety of research areas in nonlinear differential equations.

GLENN WEBB
Vanderbilt University
Nashville, TN

Review of Nonlinear Partial Differential Equations in Engineering and Applied Science, Lecture Notes in Pure and Applied Mathematics, Vol. 54, Marcel Dekker, Inc., New York and Basel, 1984, R. L. Sternberg, A. J. Kalinowski and J. S. Papadakis, Eds.

This volume contains 28 papers from the Conference on Nonlinear Partial Differential Equations in Engineering and Applied Science sponsored by the Office of Naval Research and held at the University of Rhode Island in June, 1979. The emphasis of the conference was on applications of nonlinear partial differential equations to problems in engineering and applied science. The topics presented included finite deformations of hyperelastic solids, rigidity and nonlinear elasticity, mathematical biology, unstable viscoelastic fluid flows, perturbed bifurcation theory, errors in mixed finite element methods, solutions of the Korteweg–deVries equations, free boundary problems in alloy solidification, spatial decay for the Navier–Stokes Equations, Riemannian metric for partial differential equations, shockless airfoils, singular perturbations of nonlinear elliptic boundary value problems, three-dimensional nonlinear evolution of water waves, numerical solution of two-dimensional advection flows, parabolic conservation laws, reaction-diffusion systems, steady-state bifurcation theory, singularities of nonlinear elliptic equations, discretizing the Sine–Gordon equation, numerical computation of capillary-gravity waves, integrable nonlinear field theories, numerical solution of stationary Navier–Stokes equations, similarity solutions of evolution equations, solutions for a finite depth stratified fluid, jump phenomena, Darcy's law for flow in porous media and variational problems in finite

elasticity. The volume is a valuable summary of recent applications of nonlinear partial differential equations in a wide variety of contexts.

KEVIN P. MEADE
Illinois Institute of Technology
Chicago, IL

Review of PDE Software: Modules, Interfaces and Systems, Elsevier Science Publishing Company, Inc., New York, 1984, B. Engquist and T. Smedsaas, Eds.

This book, dedicated to the memory of N. N. Yanenko, contains the Proceedings of the IFIP TC 2 Working Conference on PDE Software held at the Söderköpings Brunn in Söderköping, Sweden from 22 to 26 August 1983. The purpose of the conference was to examine modern approaches to software for solving partial differential equations. The major emphasis was on PDE software as a modular system with due consideration of the interfaces involved. In addition to the 23 regular papers, this book includes several papers from an open session and edited versions of the discussions at the end of each paper. The topics presented included theoretical and practical aspects of the vectorization of PDE software for use on supercomputers, future forms of PDE software, multigrid methods, time-dependent PDE software and applications of PDE software to the analysis of structures, transport of pollutants and modeling of semiconductor devices. Equal treatment was given to the finite element method and the finite difference method. This book is of interest to researchers in the area of modern approaches to the numerical solution of partial differential equations.

KEVIN P. MEADE
Illinois Institute of Technology
Chicago, IL